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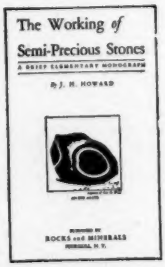

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The Official Journal of the Rocks and Minerals Association

JULY 1935

VOL. 10, No. 7

WHOLE No. 49

Mineral Collecting At Newry, Maine —Past and Present

By GEORGE E. HOLMAN

At the time when some of the great tourmaline pockets were opened at Mt. Mica in Maine, I was about 13 years of age, living in Vermont, and it was about this time that I first became interested in minerals. I read with great enthusiasm in the newspapers about these marvelous deposits of gem tourmaline and longed for an opportunity to visit the locality. However, the opportunity did not come and in fact it was a good many years later before I was able to take my first collecting trip to Maine. By that time the famous Mt. Mica locality was closed and while I was successful in obtaining specimens of beryl, lepidolite, quartz, etc., from other localities on various occasions, I made a good many collecting trips to Maine before I realized the sort of collecting I had dreamed about in my younger days back in Vermont.

While on a vacation trip to Maine in the summer of 1929, I decided to make a brief call on one of the pioneers of gem tourmaline mining in Maine—the late Mr. Lorin B. Merrill. It so happened that Mr. W. D. Nevel of Andover, Maine, who was in charge of the quarry at Newry was also calling on Mr. Merrill that day, and learning from the latter that I was interested in mineral collecting, informed me that they had recently blasted into a large deposit of colored tourmaline. This of course interested me greatly and obtaining his kind permission to collect on the property I resolved to lose no time in getting there. This quarry at the time, was being operated by the General Electric Co. as a source of pollucite from which the caesium was extracted and used in the construction of photoelectric cells.

On the following day, getting off at an early start with perfect weather to our advantage, the writer, accompanied by a friend, started for Newry. On arriving at the quarry we found that the collecting possibilities considerably exceeded our expectations. The place was a kaleidoscope of color and it seemed as though specimens suitable for any cabinet were at every hand. Surely this was a collector's dream come true!

My thoughts first turned to tourmaline as this was the one mineral that I had long associated with the Maine pegmatite regions and was also the mineral I had been able to collect but very little of on my previous trips. Before describing a few of the specimens obtained there that day, it may be well to mention that the crystals were not of gem quality and seldom terminated; nevertheless they made exceedingly beautiful and interesting specimens.

One of the first tourmaline specimens found was a crystal about one inch in diameter having a green exterior and pink center mounted on a matrix of smoky quartz together with other green crystals. This was followed soon after by a section of a large pink crystal about three inches in diameter imbedded in cleavelandite and partly surrounded by green crystals, some with pink centers. A specimen

was obtained showing three groups of pink, green and dark blue crystals in parallel growth, the matrix being cleavelandite. One specimen was obtained showing a complete crystal, red and green, in a cavity accompanied by albite crystals. Indicolite was abundant and in every shade ranging from a very dark blue to pale greenish blue, a single crystal often showing several shades. It occurred in crystals of microscopic size and densely coating the matrix, to large crystals several inches long. Several excellent specimens were obtained. Green tourmaline in muscovite was also abundant. This is one of the most interesting and beautiful associations of tourmaline.

The morning passed quickly and lunch-time came before we realized it. We seemed to have violent appetites, and after eating the lunches we had taken with us we accepted a kind invitation from one of the workmen to come into the "mess hall' and partake of doughnuts, coffee, pie, etc.

Having satisfied our appetites and being well stocked with tourmaline specimens, we turned our attention to the collecting of other minerals. Manganocolumbite was abundant and occurred in flattened, striated crystals imbedded in cleavelandite. Specimens of microlite were obtained showing brownish yellow crystals up to ¼ inch in size, octahedral in habit and modified by the faces of the cube and dodecahedron. They occurred in a cleavelandite matrix and intimately associated with lepidolite, etc. The mineral is quite friable and we did not succeed in getting any whole crystals. One irregular mass of cassiterite, 1 x 2" was found imbedded in albite. Several specimens of pollucite were obtained. Our list also included exceedingly beautiful specimens of lepidolite, pale to deep violet in color, some showing well defined crystals up to ¾ inch in size. No mention will be made of many other specimens collected showing interesting association of tourmaline wih other minerals and minute crystals of interesting and rare minerals in the matrix that would delight the enthusiast in micro-mounts.

In the late afternoon we packed our specimens and took a ride up to Mr. Nevel's home in Andover where we saw his splendid collection of first-choice specimens. This rounded out a day never to be forgotten.

The following year the writer made another trip to Newry accompanied by Mr. Charles F. Marble of Ridlonville, Maine, a field man of unusual ability. As was expected, the large, showy specimens, at least those that had been in plain sight, had vanished, but many colored fragments still remained. Attention was directed however, to the collecting of the rarer and less showy minerals which are so often overlooked by inexperienced collectors.

Specimens of eosphorite were obtained showing compact masses of a brownish gray color imbedded in cleavelandite and others, showing implanted globules made up of radiating fibers, dark gray on the exterior and yellowish brown within. This rare mineral has been found in well defined crystals at this locality, but none were obtained on this trip. A good specimen of caesium beryl was obtained. This mineral seldom shows a well defined crystal form from this locality as does ordinary beryl. It usually is of a very pale pink color and has a high refractive index. A clear piece when cut makes a beautiful gem. Purpurite was noted to be quite plentiful. The beautiful color of this mineral is usually not evident until the dark colored film with which it is coated is removed by oxalic acid. A number of specimens were obtained of a brownish gray lepidolite reported to contain an unusually high percentage of rubidium. Attractive cleavage masses of spodumene were collected. Manganapatite in irregular masses of a dark greenish blue color were rather plentiful. Specimens of triphylite (easily mistaken for indicolite) often associated with purpurite, were collected, as well as a number of specimens of cassiterite. Black tourmaline in crystals of much brilliancy and often terminated were found in the schist forming the wall-rock of the pegmatite.

No pollucite was found on the second trip, and in connection with this I would like to say that the most interesting specimen of this mineral that I have ever seen from this locality is one found by Mr. Marble on a trip in which I did not participate and presented to me by him. It shows a thin coating of pollucite on a mineral that was originally pronounced eucryptite by a prominent authority but which later was identified as spodumene by Mr. Berman of Harvard. This specimen

of spodumene shows a sort of columnar structure which I have not seen exhibited before by this mineral.

The blast in 1929 that exposed the colored tourmaline previously mentioned marked the closing of this quarry and it has not been operated since. The number and variety of minerals, many of them very rare, that have been taken out of the dumps since that time is remarkable. Although picked over as much as it has already been, Newry stands today as one of the best localities in Maine.

One may drive within one mile of the quarry by the way of route 219 which connects Rumford Point and Andover. This road intersects Route 2 near a concrete bridge and follows the west side of Ellis River. Going northwest on this route the trail to the quarry branches to the left at the Abbott Farm which is five miles above Rumford Point and 1.2 miles above a steel bridge. This trail is about a 900 foot rise to the quarry.

A list which covers at least some of the more important finds since the closing of the quarry is given below. Only a few of these minerals may be had with certainty today. The number and variety of minerals found will naturally depend on the experience of the collector, time and the element of chance. Mr. Marble informs me that he and a friend obtained 32 varieties in 4 hours time two years ago. Two expert collectors reported many finds during a few hours search last summer. It is with regret however, that I am not informed as to just what they obained. The rare mineral roscherite was found by Mr. Marble last summer and is now in the Harvard Collection.

Albite, xled
  Cleavelandite
Amblygonite
Apatite, white xls
  Francolite
  Manganapatite
Autunite
Beryl
  Caesium beryl
Beryllonite
Cassiterite
Chalcopyrite
Childrenite
Columbite
  Manganocolumbite
Cookeite
Cymatolite (alt. product of spodumene)
Eosphorite, xls and fibrous
Gummite
Hatchettolite, minute xls
Herderite
Lepidolite, xled and book form
  Rb. bearing
Lithiophilite
Manganite
Microlite
Montmorillonite
Muscovite, bordered with lepidolite
  Damourite
Pinite
Pollucite
Purpurite
Pyrochlore
Pyrolusite
Quartz, rose, definitely xled
Reddingite
Rhodochrosite
Roscherite
Siderite, small xls of odd forms
Spessartite
Spodumene
Stewartite
Torbernite
Tourmaline
  Lithia, all colors and combinations
  Iron, brilliant xls.
Triphylite
Uraninite, very small xls and masses
Uranophane
Zircon, 1/8", to 3/8" xls.

Collectors contemplating a trip to Newry and not familiar with some of the minerals listed above would do well to visit collections where such specimens are on display so as to become familiar with their appearance. Many of these minerals look so alike that mistakes in identification may be easily made in the field. An example of such similarity is shown by indicolite, triphylite, and manganapatite. Another example is pollucite, quartz and caesium beryl. Indicolite and triphylite often occur intimately associated and has led some authorities to believe that in these cases the triphylite is an alteration product of the indicolite. If this is true it is certainly an amazing case of alteration.

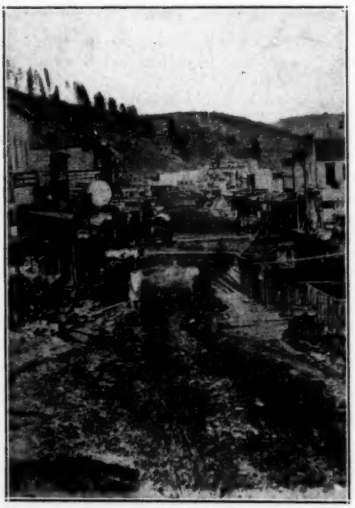
The collector may well look forward with anticipation to the time when business conditions will allow many of the quarries of Maine, now closed, to be re-opened and thereby greatly increase collecting opportunities in what is undoubtedly one of the most interesting mineral states of the Union.

Early Days of the Gold and Tin Mining Industry in the Black Hills

By DR. TITUS ULKE

In 1889 Washington City was boiling over with excitement in the contest between our two chief parties over the McKinley Tariff Bill. The provisions of this bill subsequently became the law, and one of its avowed objects was to place a duty high enough on foreign tin-ore to encourage the domestic production thereof and to build up a great tin plating industry in the United States. This latter object succeeded marvelously, for the largest tin plate mill in the world was built at McKeesport, Pa., and our nation soon became independent of other countries for our domestic supplies of tin plate.

It was also an object of the McKinley bill to develop our local tin ore resources, and so a number of tin mining and milling companies sprang up in various parts of the country. As it was known that some of the largest masses of tin ore in the world came from the region around lofty Harney's Peak, in the Black Hills of South Dakota, a well capitalized mining concern, namely, "The Harney Peak Tin Company," was established there early in 1890. I was selected as the Company's assayer and chemist. Tin ore (Cassiterite), as well as free gold, was first discovered in the region about 1874 by prospectors who accompanied the troops sent in to pacify the Sioux Indians.



Courtesy of South Dakota School of Mines
Main Street, Deadwood, 1876

When I arrived by buckboard in the heart of the Black Hills early in 1890, it was a sparsely-settled and timbered placer gold and tin mining region, abounding in big and little game.

Most of the fixed as well as roving settlers were known only by nicknames, such as "Big Shot Brown" and "Peg Leg Joe," and so, in line with this custom, and because of wearing glasses, I was promptly dubbed "The Professor." About 44 miles north of the little village of Hill City, where I ran a laboratory and assay office for the Tin Company, lies Deadwood, notorious for the activities of Deadwood Dick. Here I viewed the famous Homestake Mine —a bonanza in gold production, and met Calamity Jane and also Yuba Bill, who then drove the old Deadwood Concord Stage, carrying passengers as well as gold bullion from the mines.

Hill City had a fixed and floating population of less than 600, mostly miners, but also cowboys and tin horn gamblers, with perhaps a score of women. The village boasted in having about a dozen saloons and faro dives, where "tenderfeet" or drunken prospectors were relieved of their money, and life was by no means safe! No wonder the manager of the Harney Peak Tin Company advised me to stay away from the village as much as possible.

On my very first visit there, I was evidently spotted as a tenderfoot, and held up by a crowd of cowboys and miners. Hearing that I was the Company's new assayer, one of the miners took out of his pocket a chunk of ore and asked me to name it. Much to their surprise I guessed right, and

thereupon was led into the nearest bar and treated to whiskey, presumably as a reward for this evidence of mineralogical skill. My standing with the miners being thus established, a lucrative private practice for me in assaying for them resulted. A year later the Spokane Silver Mine was discovered by a prospector known as "Crazy Judd," chiefly because of my advice to him where to dig, and a mushroom town grew up about it over night.

In the winter of 1890 I was startled late one night by an excited armed courier, who reported that the Oglalla Sioux Indians had broken loose along the South Fork of the Cheyenne River and that the settlers there urgently requested immediate armed aid, about 100 men. Early the next day three of us, forming an advanced mounted scouting party, rode ahead past Harney Peak toward the Cheyenne River, when we heard that the Indians had already fled, and were moving toward Wounded Knee. As General Miles, with the Sixth or Seventh Cavalry, was now pursuing the Sioux, my scouting party was no longer needed, and consequently disbanded. Not long afterward, namely, on December 29, 1890, occurred the terrible slaughter of the Sioux at Wounded Knee, which definitely broke their power.

After two years of work for the Harney Peak Tin Company, realizing that tin ore did not occur in the Black Hills in paying quantities, and feeling that the Tin Company would soon pass into the hands of a receiver, I resigned my position as its assayer.

Just before leaving the Black Hills permanently, I decided to join a trapping and gold-hunting expedition to the Big Horn Mountains of Wyoming, to be financed by the owner of the biggest gambling saloon in town. All my expenses were to be paid by him and any gold or other ore discovered divided equally. Upon going into the place to make arrangements for our joint expedition, I was persuaded to take a chance "shooting dice," and, with phenomenal luck and sound mathematics, won about all the money in sight. In view of the possible danger of being waylaid upon leaving the saloon, pocketing many hundreds of dollars of winnings, I piled up a heap of "cart wheels" on the saloon bar, and

Courtesy of South Dakota School of Mines

Horatio Nelson Ross standing at the point near French Creek within Custer City where he apparently found a few colors of gold, July 30th, 1874

asked the boys in the place to have their "poison" on me, while I quietly slipped out for home.

So, after a stay of several years in the picturesque Black Hills, the writer was at last rich enough to live comfortaby for a spell without having to work, and so gave up the Big Horn trip and headed south for Pikes Peak to seek new adventures in "them thar hills" and travel about the Golden West.

Gold In Petrified Wood

By WALTER S. PALMER

Director, Nevada State Analytical Laboratory and Head of the Metallurgy Department, Mackay School of Mines, Reno, Nevada

A very interesting occurrence of gold was recently discovered in the Aspen District of Churchill County, Nevada, by Edward and Frank Nugent, Clayton Kroh and William Johnson. The occurrence consists of gold deposited in petrified wood, which in turn is buried in a volcanic tuff.

The Aspen District is in the extreme southeastern corner of Churchill County at the eastern end of the Broken Hills range and northwest of the Bruner or Phonolite District in northern Nye County. The Broken Hills range is a group of low hills lying between the Fairview and Ellsworth ranges in Churchill and Nye Counties and consist chiefly of volcanic tuffs, basalt, andesite and obsidian.

The gold bearing petrified wood is found about one quarter mile southwest of the camp known as Nigger or Tucker Wells, in the northern part of the Aspen District. In this part of the district the formation is chiefly volcanic tuff cut by dikes of andesite and overlain by basalt, in certain parts. There are some zones that are highly silicified due to hot water action.

The petrified wood has been found at present over an area of about five hundred yards square but only a small part of this area contains logs carrying gold. The logs are found practically at the surface and are lying in all positions from upright to prone. They are found by tracing float pieces of the petrified wood and then looking for discoloration at the surface, the tuff being quite light colored while the freshly exposed wood is very black due to the carbon which it contains. In size the logs seen were up to two feet in diameter and had been followed to a depth of not over fifteen feet in the tuff. It was said that some logs four feet in diameter had been found and mined. About ten to fifteen gold bearing logs have been found to date and only parts of two are now exposed, which carry gold. The others have been mined and either milled or screened and sacked for shipment.

An examination of the logs show that they now consist of crystalline and chalcedonic silica, carbon and calcite. The quartz crystals in some specimens are very small and rather loosely held together but they have preserved very plainly the annual ring growth of the original trees. Other specimens are very dense, black and hard and contain veinlets of chalcedony. No cell structure of the original wood could be observed in any of the specimens examined and therefore the species of the original trees cannot be determined, according to Professor P. A. Lehenbauer of the Department of Botany.

The specimens richest in gold are easily crushed and on washing off the black carbon, the material then has a light gray color. Under the microscope some of the crystals are seen to include black particles, probably carbon, and many of them are doubly terminated. The gold, which has been observed in the original material, occurs as both irregular and crystalline grains in the spaces between the quartz crystals. Carbon in finely divided form also helps to fill the spaces between the quartz crystals.

On examining gold, that had been separated by panning, under the microscope it was found that most of the gold consists of individual crystals although some intergrowth of crystals was noted. The most common forms noted were octahedron, cube, dodecahedron and combinations of these forms. The largest crystal noted was 0.40 mm in diameter. Some of the crystals were attached to quartz and some had cavities which appeared to be filled with carbon.

It is probable that the carbon has been a contributing factor in producing the reducing action which has precipitated the gold from circulating solutions which have come in contact with the logs. The gold bearing solutions could have come from a zone about seventy-five feet west of the hole containing the richest log, where there is found an altered zone of quartz and kaolin with very indistinct walls, which on sampling and assaying was found to carry 0.56 ounces of gold and 0.50 ounces of silver per ton.

In the hole where the richest log was found, the log had been followed to a depth of about fifteen feet and portions of the log were still to be found in the side wall of the shaft near the bottom of the hole. Along the line close to where the log had been removed, a dense chert was noted, indicating hot water action. The chert and also the tuff from this hole showed traces of gold and silver on assaying. A sample was taken of the log still remaining and showed on assaying 18.26 ounces of gold and 10.8 ounces of silver per ton, and was the richest material sampled. Gold is readily observed under the microscope, in some of the original material from this log.

From the samples assayed it is evident that the logs differ widely in their gold content and that the average material carries only moderate values. The assay on a grab sample from fifteen sacks of fine screened material showed 0.39 ounces of gold and 0.30 ounces of silver per ton and the coarse screenings assayed 0.17 ounces of gold and 0.10 ounces of silver per ton. Some of the logs showed very low values under 0.02 ounces per ton in gold and traces of silver.

Undoubtedly the carbon now found in the petrified material is a result of charring in the original wood but it is impossible to tell whether the wood was charred before or after being buried in the tuff. It could have been charred by being buried in hot tuff and it may have been charred by the action of the nearby igneous intrusions which have cut the tuff. There is also the possibility of charring by acid fumes from the volcanic vapors which could have accompanied the igneous intrusions.

No evidence was noted to indicate that the tuff was deposited in water, specimens examined do not show signs of stratification.

There does not appear to be enough of the material to be of commercial value to work for its gold content. It would be like mining very narrow veins with very small lenses of ore and a large amount of dead work would have to be done to secure a very limited tonnage. The owners do not feel that sufficient tonnage could be secured to warrant development for the gold in the material but they may be worth further development for their value as specimens of an unusual gold occurrence.

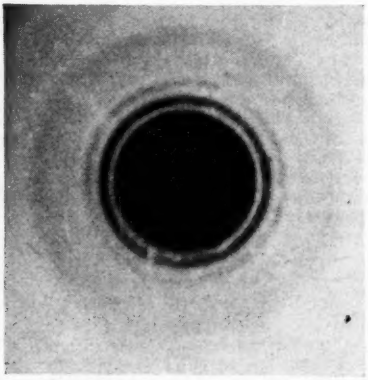
The assays reported in this article were made by Professor William I. Smyth on samples collected by Professors Palmer and Smyth on April 27, 1935.

Pleochroic Haloes

By ELIZABETH KING

This is the name that has been applied to tiny objects illustrated by the accompanying microphotograph. They have recently become very important, for they tell something about the history of our earth. All interested in geology should know what they are and be glad to co--operate in the deciphering of their messages.

These haloes consist of minute, spherical discolorations occurring in certain minerals such as biotite mica. They are only a little over a thousandth of an inch in diameter, so that a microscope is needed to see them. A thin section of one of these spheres shows under the microscope a series of concentric dark rings about a very small inclusion or nucleus. These inclusions, formed when the biotite crystallized from the magma, contained radioactive material such as uranium, actinouranium, etc. Certain radioactive substances emit alpha particles which pass through the surrounding mica with a definite range, gradually darkening it, thus giving the rings seen in pleochroic haloes. Each ring in the halo, therefore, is due to the presence of a radioactive element in the inclusion. The study of haloes thus offers the possibility of deducing the existence of hitherto unknown elements, which perhaps have long since vanished from the earth.



Microphotograph showing pleochroic haloes

Dr. G. H. Henderson of Dalhousie University, Halifax, Nova Scotia, has devised a method of comparing the relative strength of the rings produced by elements that have different rates of decay and, from these results, he is able to calculate the age of the mica. The method has been applied to three biotites, and, as a result, it is found that the biotite from Renfrew Co., Ontario, crystallized from the magma about 800 million years ago; that from Murray Bay, Quebec, 750 million years ago; while that from Mt. Apatite, Maine, is not more than 400 million years old. Dr. Henderson is very desirous of applying this method to biotites from as many different parts of the world as possible. If readers send to Dr. Henderson samples of biotite crystals one centimeter or more in diameter and of known geological source, together with a statement of the source, he will be glad to examine them for haloes. By so doing, contributors will help materially in a very interesting research.

Exciting Outing of Nevada Rocks and Minerals Study Club

By FRED G. GREULICH

Thirty-five members of the Nevada Rocks and Minerals Study Club left Reno, en caravan, Sunday morning, May 19th, in ideal weather, bound for the Como Mines, Como, Nevada, to observe the Annual National Rocks and Minerals Field Outing.

The party traveled south through beautiful Washoe Valley, hugging the eastern fringe of the Sierra Nevada Mountains, hurried past Slide Mountain, whose southern half, years ago, split away from the main mass and crashed down nearly two thousand feet. Besides burying the hillside ranches, it left a gigantic white scar in its granite face as ghastly evidence and an ominous reminder of the forces of nature.

A little way beyond, the caravan paused momentarily to view Bowers Mansion, reminiscent of the thrilling Comstock days of Sandy Bowers and Eilly Orrum.

Traveling leisurely southward, the long snake like line of the Virginia City water flume came into view. The construction of this inverted siphon was an engineering marvel in its day. Crossing the low Carson Valley Divide a long circular coast brought the eight motor cars into the smallest state capital in the United States—famous old Carson City.

Leaving Carson, the party turned eastward on highway 50, passed on the outskirts a Piute Indian village, observed a little to the north the once great, but now abandoned, Gypsum Mine; then sighted, near the highway, the deserted, desolate ghost town of Mound House, edged over the lower end of Gold Canyon in the Comstock mining district, entered the once prosperous Placer mining section, where gold was first discovered in Nevada, and then rolled into Dayton, one of the State's oldest and most historic towns. There the group stopped long enough to view the old horse drawn ore wagon, with high, wide rear wheels, huge brake blocks slung down from chains, the driver's seat elevated nearly twelve feet above ground, and observed with pleasure that the high body and wheels all shone in fresh blue and yellow paint, a condition which belied its rough use in the days of the Bonanza kings.

At Dayton, the caravan left the highway, crossed the Carson River, now running full stream, turned south and started climbing the long, rough, winding Pine Nut Range Road to Como, 12 miles distant, and about 3,000 feet upward, the day's objective.

The Como Road runs slightly east of Eldorado Canyon, where many fossilized ammonities of the Triassic-Jurassic period are found, in great numbers, in the sharply tilted shales which form a part of the east wall of the lower canyon.

A long, hard pull brought the party to the 7,000 foot elevation. There, after rounding several sharp bends, the travelers were brought directly to the very edge of Como Canyon at the bottom of which a trickling stream, nearly a thousand feet down, looked like a glistening silver thread. The walls on the inner side of the road sheered upward for another thousand feet.

A mile or so along this narrow, dangerous roadway brought the party to the main workings of the Como Consolidated Mines, the journey's end. Here a great treat was in store for the club members. Guided by Mr. Carl Stoddard, consulting geologist, and Mr. Charles Oster, general manager of the company, the party experienced the rare pleasure of walking over the surface outcrops of the mineralized vein they were later to view at close range from the 600 foot level, in the very bowels of the earth.

From the crest line of one of these veins, the great Como Vein, which is a large fissure in the Tertiary Andesite flows, the view of the surrounding country in three directions, was magnificent. To the west a long line of snow covered mountains, marked the higher reaches of the Sierra Nevadas, hiding from view, beautiful Lake Tahoe. Farther to the North loomed Mount Rose, over 10,000 feet high, next the upper portion of the same Slide Mountain the party passed several hours before, now showing as a great white patch, thirty miles distant.

Over toward the northwest about center of the picture the immense grayish green ore dumps, man-made mountains, of Virginia City and the Comstock Lode, now stripped of most of their precious metals, looked like huge ash heaps. Above these dumps could be noted the great brown gashes in the sides of Mount Davidson, the result of surface cave-ins brought on through collapse of some of the hundreds of miles of underground borings in that section.

Farther toward the east, down in the East Carson Valley, on the opposite side of the Flowery Range, from Virginia City, that small white building marked the entrance of the Sutro Tunnel, a hole driven 4 miles through mountains, intended for draining the lower levels of the steaming sulphurous waters in the Comstock Mines during bonanza days. This tunnel, however, never attained its expected usefulness and lies today, only as a worthy monument to a persevering and courageous pioneer.

Still farther eastward the vista showed the lower reaches of the Carson Valley extending out in the direction of old Fort Churchill, a landmark, whose 'dobe houses have virtually fallen to ruin.

Rawe Peak, 8500 feet, rising in the foreground to the right, guards the great mineralized veins on the north and shuts off further view toward the east.

All about the interested party, nearby, caved-in mine shafts, rotting head frames, broken assay crucibles, weather packed and aged ore dumps, fragments of miners' tools, dilapidated buildings, amidst the ever present sagebrush, all served as reminders of the brave, but futile efforts of the earlier prospectors and miners to develop the district. Concentrated effort in those days was lacking and the results were mostly grief.

On this high ground near the vein outcrop the party took time out for lunch, then started back to the portal of the tunnel to await the one o'clock train into the great hole in the hills. On arriving at the portal, the train was made ready to receive its load of human freight.

Everyone scrambled aboard, utilizing the wood blocks and wide timbers for seats, in the short, rather narrow, steel cars. Some of the members of the party declared the soft side of these timbers had an excessive number of splinters. However, those mostly affected reached a hasty method of cooperation with the timbers and no harm resulted.

The engineer, wearing his miner's garb, including the steel helmet with open flame lamp, giving the start signal "Everybody keep down," moved the control lever on his electric drive locomotive, and the happy crowd, with suppressed excitement, in seven ore dump cars, moved on its way to a new and strange adventure.

Starting in jerks, the clanking couplings eventually tightened, the train gradually gained a steady forward movement, crossed the portal, and switched the daylight into darkness.

Passing occasional drift tunnels showing in both right and left walls; here and there a wet spot in the ceiling evidenced by dripping water, many timber bracings, stretches of grim solid gray, foreboding rock, at places bulkheads holding back stubborn softened rock, the human ore-train rumbled and pitched forward underground.

After a rough, weaving, rocking, jolting, dark but thrilling ride, the train eventually stopped at a junction station, 6,000 feet in from the portal.

Here in the deepest recess of the great tunnel, the crowd piled off the train, scrambled from the cars to the floor of the twelve foot wide tunnel, to find the footing wet and soggy, with a stream of icy water flowing outward, alongside the rails. After everyone had detrained, the empty cars moved on toward the tunnel head, leaving the members of the Rocks and Minerals Study Club, standing there

in darkness with only the bleak, tunnel walls and the accelerated sound of falling water to console any timid imaginations any one might have had. As the cars passed on, some of the more bulky members found it necessary to draw in a good, deep breath to allow an unobstructed clearance.

At this underground junction station the party stood directly beneath the spot where the vein outcrops on the surface. But the circumstances differed greatly. Here, the eager and expectant group saw the great vein as Nature left it in the raw.

Approximately forty feet wide, from foot to hanging wall, of indefinite but great depth, the vein disclosed itself, more strikingly in the west tunnel wall and ceiling, as a bluish gray compact mass of dripping, soggy, broken rock, containing numerous splotches of white. Some calcite was recognized in the vein matter, but its greater bulk consisted of quartz and altered country rock. At many places, small vugs with tiny, projecting, perfectly formed quartz crystals in the recesses, reflected flashes of light from the facets, and caused some of the party to exclaim with delight. Quartz stringers traced a cross-patch network through the whole mass. With the aid of the carbide lamps, many metallic sulfides were detected. The contact at the footwall was well defined and from the plane of contact came the ceaseless drip, drip, dripping of water. A bulkhead held back the vein matter at the tunnel head, in this particular chamber.

A short distance away from the vein matter, along the right tunnel wall there appeared a drift hole. Three feet in a bulging bulkhead struggled to hold back the saturated rock material from which seeped a sizeable stream of water, cascading about two feet down to a crystal clear pool gouged from the tunnel floor.

After a close inspection of the vein, some of the party drifted on toward the tunnel head in the left chamber to view the actual mining operations, while others remained at the junction station, thinking and talking of many things. An occasional "tommynocker," a rock dropping from the ceiling, would splash the floor waters, and disturb the peace of mind of some of the more timid spectators.

Miners wearing hip boots and waterproof clothing, helmets with open flame lamps, were drilling holes for shots, at the tunnel face. Another crew operated the diamond drill, an instrument which pierces a small hole in the earth, beyond the tunnel head, for great lengths, eventually bringing out a "core" containing test material, later to be analyzed, and used for guidance. Cool circulating drafts provided the tunnel with fresh breathable air. At intervals along the tunnel walls one noted upward extending ladders leading to the surface 600 feet above.

Electric switches, which control the firing spark to the charges, were mounted on huge timbers at the Junction Station, quite a safe distance from the exploding charge.

Soon the distant rumble of the train was heard, the party stepped aside, hugging the walls, the electric tram soon came in sight and stopped. The party again got aboard for the outward journey. All aboard, the signal was given, and the train started for the daylight regions.

To add an extra trill to the unique adventure, the engineer when nearng the portal, threw wide open the throttle, and that dump train shook and trembled and raced like mad for the seemingly small hole through which sunlight streaked.

Shortly the train slowed down, emerged from the tunnel, stopped and the Nevada Rocks and Minerals Study Club, dismounted, happy and wondering at their adventurous journey.

Those included in the party were: Prof. and Mrs. Walter S. Palmer; Prof. and Mrs. Wm. I. Smyth; Mr. and Mrs. Henry Byars and son; Mr. and Mrs. Fred G. Greulich; Richard Greulich; Dr. and Mrs. Rader L. Thompson; Dr. and Mrs. L. Parsons; Phyllis Reed; Mrs. John Brockman and son, John; Capt. and Mrs. H. W. Isbell and son; Mr. and Mrs. F. J. Headley; Mr. and Mrs. Fred Browning; Miss Echo Loder; Joyce Snyder; Frances Humphrey; Daisy Benjamin; Mrs. Margraves; Mrs. E. R. Berg and Mrs. M. Haggott, all of Reno.

THE AMATEUR LAPIDARY

Conducted by J. H. HOWARD*

504 Crescent Ave., Greenville, S. C.

Amateur and professional lapidaries are cordially invited to submit contributions and so make this department of interest to all.

*Author of—*The Working of Semi-Precious Stones*. A practical guide-book written in non-technical language for those who desire to cut and polish semi-precious stones.

Dressing Tool for Carborundum Wheels

By ARTHUR KNAPP

The writer finds that his home-made dressing tool is much more satisfactory than any tool he has purchased, particularly for the fine grained wheels. Properly handled it does not knock pieces out of the edge of the wheel and gives a smoother finish.

The tool is made of discs of 20 gauge galvanized iron cut from the scraps left after making a saw. These discs are cut with the snips to a diameter of about 1¾". They need be only approximately round. They are then drilled to go to a ¼" bolt.

The handle is made by cutting a slot in a piece of axe handle large enough to take a stack of discs about ⅝" high. Drill a hole for the bolt near enough to the end to have the discs extend beyond the handle about ½". Round off the corners of the handle.

Hold the discs at an angle of about 45° and feed slowly. The discs will gradually wear round, as they cut the wheel. A very firm rest is essential for any kind of dressing tool.

Reader's Section

A Pleased Subscriber

Editor "R. & M.":

I have just received the June issue of ROCKS and MINERALS, together with all the back issues to January.

I am very much interested in the magazine, especially in the articles for the "Amateur Lapidary" by J. H. Howard. I own his Elementary Monograph, "The Working of Semi-Precious Stones" and I think it is the most clearly written work of its kind I have ever read. I am looking forward to many hours of enjoyment with the later issues I will receive in the months to come. DONALD J. WRATHALL.
Providence, R. I.

Articles Wanted

Editor "R. & M.":

Can't you find someone to contribute an article on the Herkimer Co., N. Y., quartz crystal localities, history of their discovery, present condition of the deposits, etc.; and a similar article on the Hot Springs, Arkansas locality? I think these articles would prove of great interest to many readers of ROCKS and MINERALS.

FRED E. TURNER.
Willimantic, Conn.

Club and Society Notes

New Haven Mineral Club

A number of field trips for the summer have been arranged and members and their friends are urged to attend each and every one of them. The next one will be Sunday, July 21st, Tilly Foster Iron Mine, near Brewster, N. Y.

Members will meet at 9:00 A. M. (D. S. T.) at Peabody Museum, New Haven, Conn., at the mine at 10:00 A. M. (D. S. T.). Those having cars with room for an extra passenger or two, are requested to pick up members.

Subsequent trips will be listed in ROCKS and MINERALS.

Amateur Geologists Association (Chicago, Ill.)

A two days field trip, sponsored by the Association, was held on May 25th and 26th. During the first day, trips were made to the Vinegar Hill Zinc Co. Mine at Platteville, Wisc. and approximately 75 of the party which totalled 82 went into the mine, the depth of which was 170 feet, and spent nearly an hour collecting specimens underground; from the mine the party went to the Roasting Plant of the same company, located at Cuba City. In the afternoon the Crawford Mine Mill at Hazel Green, Wisc., was visited; later fossils were collected at an abandoned quarry near Etna.

The second day, Sunday May 26th, a number of interesting rock formations around Platteville, Wisc., were examined; later the party drove to Dubuque, Iowa, where at the Dubuque Quarry excellent calcite crystals were collected in abundance. The trip officially adjourned at this quarry.

During the entire trip the party was managed by the Chairman, Mr. G. Frederick Shepherd, and was under the leadership of Dr. Ball and Mr. Miller, of the Geology Department of Northwestern University. The trip was pronounced a complete success and requests for additional trips were received.

Natural History Society of Maryland

The Department of Mineralogy of the Natural History Society of Maryland has, for the past two years, been compiling a check list of the minerals of the State of Maryland. Results so far have been most gratifying. All readers and subscribers of ROCKS and MINERALS residing in Maryland, are urged to co-operate with the Society and to register with them as being interested in mineralogy. Address letters to the Department of Mineralogy, Natural History Society of Maryland, 2103 N. Bolton St., Baltimore, Md.

Specimens of talc from many parts of the world have been placed on exhibition among the economic geology collections at Field Museum of Natural History. Talc is a mineral which finds many uses on account of its extreme softness and unctuousness. Talcum powders account for but a small part of the talc used—for every pound ground for powder, forty pounds are used in other ways. More than a third of the talc mined is used as a filler in paper making to give the product body; nearly a quarter of it is used as an ingredient of paint; and there are some sixty other industrial uses. In Colonial times, according to H. W. Nichols, curator of geology, talcum powder had not yet come into general use, and mothers often used fuller's earth as a baby powder.

MINERALOGY QUIZ

(Answers on Page 112)

1. What is chalcopyrite?
2. Is it a rare mineral?
3. What is its color?
4. What mineral does it resemble?
5. How can these two minerals be recognized?
6. Does chalcopyrite occur in crystal form?
7. Is chalcopyrite subject to tarnish?

Rocks and Minerals Association 3rd National Outing

Reports of 11 States Show 745 Present

The Third National Outing of the Rocks and Minerals Association, held May 19th, 1935, in 11 states was a grand success. The grateful thanks of the National Director of Outings, Mr. Fred W. Schmeltz, is extended to all directors and their assistants for their co-operation in making this outing so highly successful. Reports on individual outings are as follows:

CALIFORNIA

No outing held.

CONNECTICUT

Director—MRS. LILLIAN OTERSEN

The New Haven Mineral Club held its National Outing at Strickland's Quarry, Portland, Connecticut. There were 75 enthusiasts present from all parts of Connecticut and the day being ideal everyone was well satisfied with the trip.

The finds of the day consisted of montmorillinite, green beryl, pink beryl, black and green tourmaline in abundance, spodumene which phosphoresces a nice orange under the iron arc, some exceptionally fine specimens of fluorite, apatite, garnets, cleavelandite, columbite, cookeite, pyrite, mica crystals, feldspar crystals, many microscopic mineral specimens and quartz.

The club is nearing the end of its second year which has proven a most successful one. The membership has increased together with the enthusiasm of its members.

ILLINOIS

Director—BEN H. WILSON

The Illinois outing which was held on May 25th and 26th consisted of a Geological pilgrimage from Chicago up into the lead and zinc mining regions of southwestern Wisconsin, centering around the old mining town of Platteville. Here a trip was made into the mines, and through the various mills and acid plants present in this vicinity.

The trip was sponsored by the Amateur Geological Society of Chicago, who made all of the arrangements under the leadership of G. Frederick Shepherd, Chairman, and the scholarly atmosphere and advise was furnished by Dr. John R. Ball, geologist of Northwestern University, who accompanied the party as field lecturer.

About thirty cars with 82 collectors made the trip, and all returned having been well repaid in a generous supply of new mineral specimens and experience for their trouble, looking forward to another trip, possibly to the fluorite country of southern Illinois, next year.

MARYLAND

Directors—A. LLEWELLYN JONES and W. E. PRICE

An enthusiastic party of eighteen gathered at the stated place and time. The early arrivals on the scene had a chance to visit the nearby headquarters of the Natural History Society, where the laboratories and collections were offered to their inspection. With a fine day for collecting the party left in high spirits, and the below mentioned localities were visited. Lunch was had near the Jones' Falls quarry. At the Jones' Falls pegmatite location, some interesting potholes and faults in the rock were examined, and throughout the day many photographs were taken of the formations.

The places visited and the minerals found are as follows:

(1) Near Baltimore, at Landsdowne, in the sedimentary deposits—hematite, limonite, wood replaced by limonite, concretionary siderite, lignite, and ironstone sand concretions.

(2) In Baltimore, at Jones' Falls quarry in gneiss—albite, microcline, biotite, garnet, stilbite, pyrite, and ilmenite.

(3) In Baltimore, at Falls and Clipper Mill Roads in pegmatite—microcline, muscovite, almandite, apatite, and autunite.

(4) In Baltimore, at the Woodberry Trap Quarry in gabbro—laumontite and calcite crystals.

(5) Baltimore Co., near Bare Hills at the McMahon quarry in Cockeysville Marble—phlogopite, tremolite, brown tourmaline and rutile.

We wish to advise that the outing was enthusiastically received and met great success. We hope that the Rocks and Minerals Association will continue to sponsor these splendid outings.

MASSACHUSETTS

Director—JOHN KITSON

Assistant Directors—PROF. BENJAMIN SHAUB, Technician; ANTHONY KENDREW, Registration; THOMAS RYAN, Transportation; and WALTER CONNOR

The Massachusetts division of the Rocks and Minerals National Outing was an unqualified success. More than 150 registered at the Hall where Professor Benjamin Schaub delivered a splendid talk, which was illustrated with lantern slides of minerals photographed in natural colors. Assistant director, Walter Connor worked the lantern like a veteran while assistant director, Anthony Kendrew greeted the visitors, performed necessary introductions and took charge of registration. Director Kitson opened the meeting with appropriate remarks in behalf of Rocks and Minerals Association and then introduced the speaker, Professor Schaub, who spoke for an hour. His talk was an excellent one which held the enthusiastic interest of both laymen and professional.

Following the meeting the automobiles of the visitors were arranged in a long procession which was escorted through the town by the Chief of Police and a special squad of traffic officers. On arriving at the mine on the farm of Mr. Schranz in West Farms, thirty or more visitors were there to greet us and for several hours the sound of hammers and happy shouts filled the air. Even though there were two hundred collectors present, the three mine dumps looked just as large after the party had dispersed. Mr. Schranz, the owner of the property weaved in and out among the crowd

extending cordial invitations to the visitors to enjoy themselves and come again any time.

The best "find", a good specimen of wulfenite, was made by Prof. George Bain of Amherst College. No record of wulfenite occurrence at this mine, previous to this find, had been reported to the directors.

During the afternoon the Springfield Natural History Museum group, Dean Homer Little and Director Kitson, talked over suggestions for next year's outing and it was agreed that the old emery mine at Chester would be a desirable location to visit. Inquiries will be made relative to this matter during the summer.

Aside from Colleges and Museums, visitors representing high schools, grade schools, prep. schools, offices, barber shops, factories, doctors, dentists, banks and baker shops were there. All concerned are mighty proud of the turnout and the expressed enthusiasm.

MICHIGAN

Director—A. F. COMBS

The Michigan Section held its National Outing Saturday, May 11, at Ann Arbor, Michigan. The afternoon was spent at the Mineral Museum of the University of Michigan, with dinner at the Michigan Union. In the evening they attended a demonstration of a high temperature furnace, given by the Ceramic Society, and later a lecture by Dean Kraus on "Gems and Gem Cutting." Approximately seventy-five persons attended the outing.

The Michigan Mineralogical Society has now a membership list of eighty-two. Meetings are held on the second Monday of each month in the auditorium of the Cranbrook Institute of Science, where visitors are always welcome.

NEVADA

Director—FRED G. GREULICH

Note—See special article on page 105.

NEW YORK-ALBANY DIVISION

Director—R. R. RITCHIE

Sunday, May 19, was clear and cold. I did not have long to wait, by 9 A. F. a car came in from Cairo, bearing S. Edmond Cozine and L. A. Miller. As the morning was cold we put another log on the fire in the cabin and got better acquainted. Along came Mr. and Mrs. C. Lloyd of Fort Johnson, J. W. Palmer, of Amsterdam, Mr. and Mrs. Rastrut of Amsterdam and Raymond Conover and his sister of Kyserike. Again we put two more logs on the open fire and then ate our lunch. The sun came out gloriously and I took the group over the Petrified Gardens. We saw here three varieties of Petrified Algae. Cryptozoon, Trilobites and sea mosses.

Then for Mount McGregor, 7 miles away. At the village of Milton on Route No. 9 we stopped at the village Inn. Our host there was a Mr. Flinn; he is the owner of the mill at the foot of the mountain which is only one block from the Hotel. He told us to take anything we wanted from the rock pile at the mill. The rock hounds got busy and were so earnestly at work on the pile of broken feldspar you would think they were a group of Scotchmen who had lost a borrowed nickel. The minerals found here were—quartz, feldspar, tourmaline and mica. Each person had two armsful of minerals as he made his way back to his car. We stayed here a little while longer as Raymond Conover from Kyserike exhibited to our amazement many beautiful polished gem stones from 1 to 10 carats, which he, himself, had cut and polished; he is a modest person but all agreed that he is a craftsman.

We bade goodbye to Mr. Conover as he was going two miles up the mountain to examine a feldspar quarry. We wished him luck.

The tour was completed by a trip to a nearby Reservation. My big thrill was on parting; my guests told me that 50 should have come for the outing instead of 11, as it was all so wonderful.

NEW YORK—(Metropolitan Area)

Director—EMMET DOHERTY

Leader and Lecturer—JAMES F. MORTON

For the first time, since outings were instituted, the Metropolitan group, held its activities out of the state. The outing this year was held at the world-famous zinc mines at Franklin, New Jersey and it was a grand success. Many fine specimens of zincite, franklinite, willemite, calcite, fluorite, norbergite and others were obtained by the 150 mineral collectors who were present. Mr. James F. Morton, Curator of the Paterson Museum, Paterson, N. J., was Leader. He also delivered a most interesting talk on Franklin minerals immediately after pictures of the group were taken.

PENNNSYLVANIA

Director—JOSEPH L. GILLSON, ScD.

A party of 66 left the Philadelphia & Western Railway Station, Norristown, Pa., at 10:15 A. M. in 18 machines and 1 truck. Weather was perfect for such an outing.

First Stop: at Kibblehouse Quarry, which is actively working. It is a large gray shale quarry. Specimens obtained; Calcite, Chabazite, Chalcopyrite, Epidote, Garnet, Heulandite, Natrolite, Pyrite and Stilbite.

Second Stop; at Perkiomen and Ecton Copper Mines. Mines have not been worked for upward of 50 years, but the old dumps yielded the following specimens; Ankerite, Bornite, Calamine, Chalcopyrite, Chrysocolla, Cerussite and Malachite.

The party then divided, 8 going to Robeson and the rest to Phoenixville. At Robeson the following specimens were obtained; Calcite, Chabazite, Chalcocite (?) Epidesmine, Hematite, Heulandite, Natrolite, and Stilbite.

At Phoenixville the following were obtained; Chalcedony, Galena, Pyromorphite, Quartz Crystals, Sphalerite and Wulfenite.

W. H. FLACK

RHODE ISLAND

Director—A. W. QUINN

A party of eight made the most of a very delightful day by visiting two of the better Rhode Island mineral localities. The first stop was at the Manton Avenue quarry on Violet Hill, Manton, R. I., where considerable variety of minerals, usually in small specimens, can be found. From Manton the party went to Durfee Hill "gold mine" located on Durfee Hill which is near the northwest corner of the state and which is the highest point in Rhode Island, all of 805 feet above sea level! At this locality we found good crystals of epidote, pyrrhotite, pyrite, molybdenite, molybdite, a little hornblende, and large masses of crystalline calcite in vein quartz.

UTAH

Director—JUNIUS J. HAYES

Owing to a very stormy Sunday on May 19th the outing of the Rocks and Minerals Association was postponed to a later date. The outing was held on June 9th.

The trip was made to the Utah Copper mine at Bingham. This is the largest open-cut copper mine in the world and is the greatest producer of metals among all the great mines of Utah. Besides

copper it is a heavy producer of gold, silver and lead. The mine and mills when working at capacity handle 60,000 tons of ore each day. The ore is low grade but the great volume handled makes it a rich producer.

The ore occurs in a monzonite porphyry and as far as the copper is concerned, is made up of chalcopyrite, bornite, covellite, malachite and azurite. Much of the gold occurs with the copper but quite a little is native. The silver and lead are in large bedded veins in limestone on the south side of the district. Mr. Myers of the Copper Co. acted as guide for the group during the forenoon, and explained many things to us about the origin of the ore, the many minerals, the operation of the vast mine and many of the interesting phases of its history. We were given permission to go over the company's ground at will, except where men were working. We made use of this privilege all the afternoon gathering specimens and observing the operations of this giant mine. Besides many specimens of various kinds of copper ores we obtained specimens of galena, molybdenite, pyrites, and some very fine quartz crystals.

One of the most interesting features was a visit to a large mineral collection of one of the employees. He has spent years in getting together the finest and largest minerals in the locality and for a private collection it is wonderful. Personally I have never seen anywhere, finer specimens than he has.

Fifteen people made the trip. Prof. A. L. Crawford, ore microscopist at the University of Utah was one of the party and we were very fortunate in having him with us, and to assist in taking charge of the outing.

VERMONT

Director—F. L. PARMENTER

The annual outing sponsored by the Mineralogical Society of Springfield was favored by a clear cool day.

Leaving town at 7:15 in the morning ten enthusiasts went to the Golden Keene feldspar mine in Alstead, N. H. where specimens of beryl, feldspar, iron garnet and mica crystals beside rose quartz and other minerals were found.

The mining company employs a double shift of 40 men in a mine about 225 feet deep with underground tunnels where plenty of ice is still in existence and will be until the middle of the summer.

The next location visited was the famous Beryl Mountain located near So. Ackworth, N. H. Some stripping and open cut work had been done last fall, exposing in particular end views of large beryl crystals, some of which are surrounded by about two inches of feldspar on all six sides. Some of the crystals are over twelve inches across flats, which are located in a solid quartz ledge.

Specimens of beryl crystal, rose quartz, feldspar and mica were also secured here.

After eating lunch the party continued on to Claremont, N. H. where single and cross shaped twinned staurolite crystals were found on Green Mountain.

The party traveled about 125 miles and consisted of Hugh Ridlon and Robert Scudder of Cuttingsville, Dana Brownell, Roy Lyons, Guy Baker, Earl Wilson, Alverdon Higgins, Pearl Dyke, Forrest Parmenter Jr., and F. L. Parmenter, of Springfield.

Acknowledgments

We wish to acknowledge receipt and express our sincere thanks for specimens and other donations recently sent us by some of our subscribers.

Albee, Allison, Rye, N. Y.—A number of minerals, including a diamond drill core of gneiss that was taken out of the old Tilly Foster Iron Mine, near Brewster, N. Y. many years ago. The core was from the 1700 foot mark.

Clinesmith, C. N., Ellensburg, Wash., a very choice specimen of crystallized sylvanite on phonolite from the famous old Isabella Mine, Cripple Creek, Colo. Mr. Clinesmith personally collected the specimen in 1907 at the time when he was mining the ore on a lease which he held.

Faux, Floyd R., Bethlehem, Pa., two dainty aragonites collected in a cave near his city.

Forbes, P. L., Stauffer, Ore., a large number of chalcedonys and opals from his locality and which represent new "finds."

Pohl, John C., Jr., Easton, Pa., three specimens including a remarkably fine zincite from Franklin, N. J.

Vail, Roy, Warwick, N. Y., some dainty little spinel crystals, a fossil fern, and a number of pyroxenes, all from his locality.

MINERALOGY QUIZ (Answers)

(Questions on Page 109)

1. A sulphide of copper and iron.
2. No. It is very common and is the chief ore of copper.
3. Brass-yellow.
4. Iron pyrite.
5. Iron pyrite is hard (a knife will not scratch it) Chalcopyrite is softer, a knife scratches it and leaves a greenish-black mark.
6. Yes, and its crystals are often very beautiful.
7. Yes, its surface is often coated by a series of brilliant iridescent colors.